Ambient Warming of Nasal Irrigation Solutions: Implications for Safe Topical Drug Delivery and Patient Compliance

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Background:
Topical drug delivery for chronic rhinosinusitis using nasal irrigation or nebulization is gaining popularity. Paranasal sinus exostoses(PSE) appears to be a complication of cold nasal irrigations, akin to exostoses in the ear canal. Many compounded irrigation solutions require refrigeration,and patients are advised to irrigate with solutions at room temperature. However, the time it takes for common irrigants to adequately warm is unknown.

Methods:
Standard formulations of common sinonasal medications and saline were tested. A non-contact laser thermometer was used to record temperatures within the refrigerator, and at standard intervals until the solutions reached ambient temperature. A NasoNeb device was also used and temperatures pre and post-nebulization were recorded.

Results:
Ambient temperature was 73.5 °F. The average refrigerated temperature was 43.5 °F. After 45 and 60 minutes of passive warming, the average temperature of the solutions was 59.8 °F and 62.5 °F, respectively. It took 120 minutes for these solutions to approach ambient temperature. The rate of warming of the various solutions was similar. When solutions were nebulized directly out of the refrigerator, they warmed from 40.5 °F to 61.7 °F on average.

Conclusion:
Although the critical temperature associated with PSE formation is unknown, it seems prudent to advise patients to leave refrigerated irrigation solutions at room temperature for at least 45 minutes prior to use, or to actively warm them. The protracted time taken for ambient warming may impact patient compliance for using solutions at room temperature. Temperature appears less of an issue with nebulized drug delivery.